



MOOC: A FRAMEWORK FOR LEARNERS USING LEARNING STYLE

* Jayakumar Sadhasivam¹ | Ramesh Babu Kalivaradhan²

¹ School of Information Technology and Engineering, VIT University, Vellore, Tamil Nadu, India – 632014.

(*Corresponding Author)

² School of Computer Sciences and Engineering, VIT University, Vellore, Tamil Nadu, India – 632014.

ABSTRACT

A modern problem of current societies is the excellence of their education structures. MOOCs are innovative devices that have been utilized to enhance and augment the traditional educational framework. MOOC is defined to have enormous profit by its technological advances. When an instructive stage is available and still there is a scope for components to give virtual instructive situations where each learner is viewed as a principle performer in the outline of the learning process, thereby adding to expand the quality of education. It is essential for the MOOCs providers to see if learning is more powerful when it is introduced through one methodology as opposed to another methodology. This is especially essential when working with understudies with particular learning challenges who frequently experience issues get to realize when it is just exhibited through their weaker methodology. What we should remember is that people are different, and each of us learn differently(1). The very same learning conditions, guidance and instructions(2) that can be so effective for one person can cause problems for another(3). The learning styles must be anticipated deliberately, in light of the fact that the mental equalization is variable in nature and the MOOC are differentiated in light of the learning design, environment, time and their state of mind. Since 1930 the term learning style has been broadly utilized in psychology and pedagogy. Specifically, MOOC more often need components for perceiving users' learning styles, which depict the way a learner procures and process data. In this plan, we adduce a framework for automated identification of learning styles in MOOC. A key objective of this system design is to furnish and understand the user learning styles in MOOC.

KEYWORDS: MOOC, Learning Style, Higher Education.

1. Introduction:

Over the last decades, Massive open online courses (MOOCs) have become a more extended curiosity for learners, providers, university, and researchers. Free online courses have been accessible since the mid-2000s. The MOOC methodology is generally known in that it can achieve a wide group of learners. When MOOCs have been the trend in university education when course, provider offers the college grade certificate for MOOCs course.

In the year 2015, 1800 additional MOOC courses were introduced and totally 4200 courses from over 550 universities(4), and the number of learners more than 35 million and 17 million from last year (2015). In 2014, Coursera claimed the number of students registered for MOOC courses compares to all other MOOC providers combined. In the most recent three years, over 25 million learners from around the world have registered in Massive Open Online Courses (MOOCs) platforms(5).

Late results from MOOCs providers, the distinctive issue are high dropout rates all through the MOOCs. It has frequently been highlighted that MOOCs experiences from a high drop-out rate or low completion rates. There are thousands of learners signed up for a MOOC course and completion rates in hundreds only. Hollands and Tirthali (2014, 42) state that "3% to 15% of all enrollees" complete a course, whereas Jasnani (2013, 6) writes about "the typical completion rate of below 10%, approximately 7.5%" (6).

As part of reducing the drop-out rate and increasing the way of learning, here we created a framework for better way of learning through learning styles.

As of late, education researchers have concentrated more on different parts of learning styles and how they can be examining in education innovation. Investigations about learning styles in innovation improved learning were directed and a few versatile frameworks were created that go for fusing learning styles and giving courses that fit to the individual learning styles of students.

2. Learning style in education:

Learning styles are authentic as the appropriate techniques or methods in which learners learn, comprehend and get information. A few analysts characterized a learning style as a methodology of taking in a thought. This is because each learner has an alternate favored way to deal with comprehension or learning things. For instance, some learners adopt to and accomplish bigger if acquirements visually, while others may adopt to apprentice aurally (7).

2.1 Learning Model's:

Thinking about learning styles for the learners inside the traditional classroom may be a tough task for instructors. Instructors have just a constrained time in setting up their content or information and conveying their lessons, lectures, and tutorials. Built up pedagogical hypothesis indicates a few learning style models, including Kolb Experiential Learning Theory, the VARK Model, Felder –

Silverman Learning/Teaching Style Model and Dunn and Dunn Learning Style Model(8). Additionally, each of these models has diverse depictions for the learning style.

2.2 Kolb Experiential Learning Theory:

In 1985 David A. Kolb's developed his experiential learning model. Kolb delineate his learning process in two dimensions, preferred mode of perception and processing. Perception direction of the Concrete Experience and Abstract Conceptualization Processing closer to the Reflective Observation and Active Experimentation. As indicated by Kolb's Learning Styles Inventory classifies people into four types(9)

- Accommodator = Concrete Experience + Active Experiment: strong in "hands-on" practical doing (e.g., physical therapists)(10)
- Converger = Abstract Conceptualization + Active Experiment: strong in practical "hands-on" application of theories (e.g., engineers) (10)
- Diverger = Concrete Experience + Reflective Observation: strong in imaginative ability and discussion (e.g., social workers) (10)
- Assimilator = Abstract Conceptualization + Reflective Observation: strong in inductive reasoning and creation of theories (e.g., philosophers) (10)

The Learning Style Inventory (LSI) rates a person on each of the four dimensions utilizing a self-depiction position taking into account of 12 questions with four optional responses. Respondents are asked to rank the alternatives consistent with how nicely they suppose every fit with how they might cross approximately learning something. Predicated on the results of this LSI, a "Learning-Style Grid" can be composed for each person. The four basic learning styles developed by Kolb are:

- **Diverger:** This learning style emphasizes concrete experience ("feeling") and reflective observation ("watching")(11).
- **Assimilator:** This person's dominant learning abilities are abstract conceptualization ("thinking") and reflective observation ("watching")(12).
- **Converger:** The convergent learning style relies on abstract conceptualization ("thinking") and active experimentation ("doing")(13).
- **Accommodator:** The fourth learning style emphasizes concrete experience ("feeling") and active experimentation ("doing").

2.3 Dunn and Dunn's Learning Style Elements:

Rita Dunn and Kenneth Dunn have revealed extensively within the field of education. They define learning styles as "the manner in which at least 18 different

elements of four basic stimuli affect a person's ability to absorb and to retain information, values, facts, or concepts"(14). The four fundamental components of learning style proposed by Dunn and Dunn are:

- **Environmental Elements:** Sound, light, temperature, and design (e.g., "Sound or external noise may positively or negatively influence learning style") [15].
- **Emotional Elements:** Motivation, persistence, responsibility, and structure (e.g., "Motivated, persistent, responsible students usually require little structure and supervision").
- **Sociological Elements:** People can learn in a variety of sociological patterns that include working alone, with one or two friends, in a small group, or as a part of a team . . . or some variation of these".
- **Physical Elements:** People learn through different senses such as auditory, visual or tactile senses or a combination of senses.

Predicated on these concepts, Dunn and Dunn (1975) argue that knowing a student's learning style predilection can make an instructor more sensitive to that individual.

2.4 Learning Modalities:

Learning modalities proposed by Walter Burke Barbe and colleagues, It's often identified as VAK

- **Visual** - Visual learners prefer to see and learns from the visual objects. Such as video, graph, charts, picture, shape, sculpture, painting etc.
- **Auditory** - Auditory learners prefer to listen and learn. Such as Listening, Rhythms, Tone and chants
- **Kinesthetic** - Kinesthetic learners prefer to learn from the physical activities are also called as tactile learners.

2.5 VARK Model:

VARL Model is Neil Fleming's VARK model expanded from VAK Model of Barbe and colleagues. The VARK has four sensory modalities are

- Visual Learning
- Auditory Learning
- Read/Write Learning

- Kinesthetic Learning.

2.6 Felder and Silverman's Learning Styles Model (FSLSM):

A standout amongst the most broadly utilized models of learning styles is the Index of Learning Styles (ILS) developed by Richard Felder and Linda Silverman. As per this model there are four dimensions of learning styles. Assume these dimensions as a time with one learning preference on the left and therefore the alternative on the way right. [16]

- Active / Reflective
- Sensing / Intuitive
- Visual / Verbal
- Sequential / Global
- **Active:** Active learners learn by doing something with information. They prefer to process information by talking about it and trying it out [17].
- **Reflective:** Reflective learners learn by thinking about information. They prefer to think things through and understand things before acting.
- Sensing learners prefer to take in information that is concrete and practical. They are oriented towards details, facts, and figures and prefer to use proven procedures. They are realistic and like practical applications.
- Intuitive learners prefer to take in information that is abstract, original, and oriented towards theory. They look at the big picture and try to grasp overall patterns. They like discovering possibilities and relationships and working with ideas [18].
- Visual learners prefer visual presentations of material – diagrams, charts, graphs, pictures. [19]
- Verbal learners prefer explanations with words – both written and spoken.
- Sequential learners prefer to organize information in a linear, orderly fashion. They learn in logically sequenced steps and work with information in an organized and systematic way [19].
- Global learners prefer to organize information more holistically and in a seemingly random manner without seeing connections. They often appear scattered and disorganized in their thinking yet often arrive at a creative or correct end product [19].

Table1: Learning Style Models Comparison

Learning Style Models Comparison					
Learning Model	Invented by	Description	Learning Style Inventory	Explanation	Learn Best Through the Use of
Kolb Experiential Learning Theory	David A. Kolb's in 1985	His learning process in two dimensions, preferred mode of perception and processing. Perception towards the concrete experience and abstract conceptualization processing towards the reflective observation and active experimentation	Accommodator	Concrete experience + active experiment. Learning style emphasizes concrete experience ("feeling") and active experimentation ("doing"). (e.g., physical therapists)	<ul style="list-style-type: none"> • Practical learn • Need to-do and learn
			Converger	Abstract conceptualization + active experiment. The convergent learning style relies on abstract conceptualization ("thinking") and active experimentation ("doing"). (e.g., engineers)	Learn through interaction
			Diverger	Concrete experience + reflective observation. This learning style emphasizes concrete experience ("feeling") and reflective observation ("watching"). (e.g., social workers)	Learn better by themselves than with other people
			Assimilator	Abstract conceptualization + reflective observation. This person's dominant learning abilities are abstract conceptualization ("thinking") and reflective observation ("watching"). (e.g., philosophers)	learn through conversation that takes a logical and thoughtful approach.
Dunn and Dunn's Learning Style Elements	Rita Dunn and Kenneth Dunn	The manner in which at least 18 different elements of four basic stimuli affect a person's ability to absorb and to retain information, values, facts, or concepts	Environmental Elements	Sound, light, temperature, and design (e.g., "Sound or external noise may positively or negatively influence learning style").	Learn from environment and surroundings
			Emotional Elements	Motivation, persistence, responsibility, and structure (e.g., "Motivated, persistent, responsible students usually require little structure and supervision")	Learning through emotional behavior
			Sociological Elements	People can learn in a variety of sociological patterns that include working alone, with one or two friends, in a small group, or as a part of a team . . . Or some variation of these"	Learn Individual or Group session.
			Physical Elements	People learn through different senses such as auditory, visual or tactile senses or a combination of senses.	Learn from audio, video, gaming.

Learning Modalities	Walter Burke Barbe and colleagues	It's often identified as VAK	Visual	Learners prefer to see and learns from the visual objects. Such as video, graph, charts, picture, shape, sculpture, painting etc.	<ul style="list-style-type: none"> Charts, graphs, diagrams, and flow charts Sight words Flashcards Visual similarities and differences Pictures and graphics Maps Silent reading Written instructions Computer assisted learning
			Auditory	Learners prefer to listen and learn. Such as listening, rhythms, tone and chants	<ul style="list-style-type: none"> Discussion, dialog, debate Memorization Phonics Oral reading Hearing anecdotes or stories Listening to tapes or CDs Co-operative learning groups
			Kinesthetic	Learners prefer to learn from the physical activities are also called as tactile learners.	<ul style="list-style-type: none"> Playing games Role playing Read body language/gestures Mime Drama Learn or memorize while moving (pacing, stationary bike, finger or whole body games)
VARK Model	Neil Fleming's VARK model expanded	Its expanded from VAK Model of Barbe and colleagues	Visual Learning	Visual learning is a showing and learning style in which thoughts, ideas, information, and other data are connected with pictures and strategies.	Learning by watching
			Auditory Learning	Auditory learning is a learning style in which a man learns through tuning in. A sound-related learner relies on upon listening to and talking as a primary method for learning.	Learning by listening
			Read/Write Learning	Read & Write Learners make good traditional studiers. They fit in with the conventional, school-taught study method of reading textbooks and writing notes.	Learning by reading and writing.
			Kinesthetic Learning	Kinesthetic learning or tactile Learning is a learning style in which learning happens by the students completing physical exercises, as opposed to listening to an address or watching shows.	<ul style="list-style-type: none"> Learning by doing "Hands-on" Creating maps Building models Art projects Using manipulatives Drawing, designing things Writing / tracing
Felder and Silverman's Learning Styles	Richard Felder and Linda Silverman in 1988 and revised in 2002.	One of the most widely used models of learning styles is the Index of Learning Styles. Four dimensions of learning styles	Active / Reflective	<ul style="list-style-type: none"> Can be impulsive Risk-takers Do not prefer lectures Prefer group work Tend to be interpersonal Not inclined to too much note-taking Prefer to think about concepts quietly before any action Learn by thinking Like writing Tend to be intrapersonal and introspective 	<ul style="list-style-type: none"> Prefer "doing, discussion, explaining" vs listening and watching Prefer active experimentation Like acting and role playing Like team competition Tend toward deductive learning Prefer reflective observation Intrapersonal skills valued Journals Learning logs
			Sensing / Intuitive	Reception is visual as opposed to verbal	Learning by practical and realistic
			Visual / Verbal	Perception is sensing as opposed to intuitive	Learning by watching
			Sequential / Global	Understanding is sequential as opposed to global	Learning via Graphical representations

Learning style will increase the productivity, improve the problem-solving ability and use to learn more effectively.

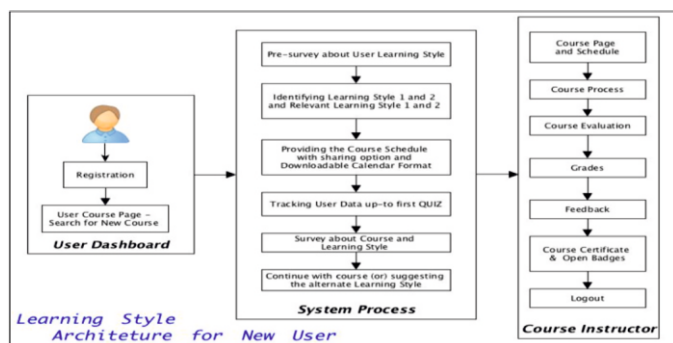


Figure: 1 – Shows the process of new user adopting to his learning style.

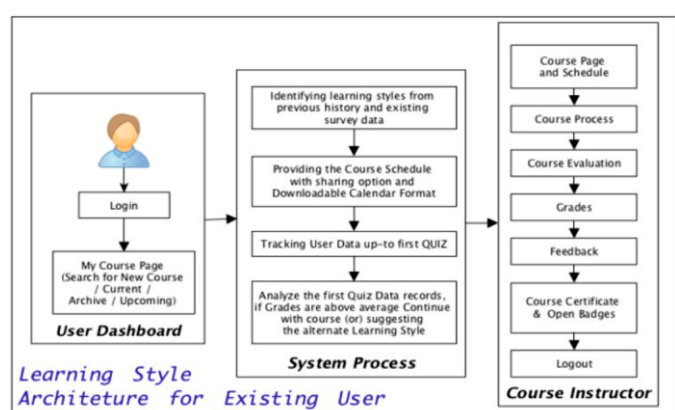


Figure: 2 – Shows the existing user making use of his/her previous history and survey data about learning styles.

3. LEARNING STYLE ARCHITECTURE

3.1 Registration:

The online course enlistment framework is the focal piece of the authoritative framework. The enrolment is the procedure of recognizing the user details including his education, location and working background details. If user enroll through google mail id, we request that the consent to access user google calendar and to-do list. Every user must confirm their email id to finish the enrolment to gain access to the course page.

3.2 Login:

The login used to provide access to the current user through the enrolled email id and password.

3.3 Dashboard:

Once the user sign-in into the course site, he/she divert to the dashboard. Dashboard is an administrative data framework, where you can get to all the data about the course framework. Dashboard offers access to the enrolled course and gives the schedule for the flow week conspicuous components moreover user to look at other courses in the site to enroll. In Dashboard courses are categorized by current, chronicle and forthcoming courses. It helps the user to viably recognize the completed and forthcoming courses through dashboard. Dashboard recommends courses to the user to take a course based on his course and learning style history.

3.4 Pre-survey about Learning Styles:

While going by dashboard first time, the dashboard pop-up to carry out a survey. This study is intended to recognize the client learning routines and styles. Subsequently analyzing the surgery results system bestows learning style to the user. The framework includes two sorts of learning styles and significant learning styles in the dashboard.

3.5 Course Registration and Schedule:

User search for a new course and enroll for that course. Once the user enrolled in that course, the dashboard gives the definite schedule for the course. The system gives the course plan in the downloadable format, so that user can download and import to his personal calendar. Once the user enrolled to the specific course, system recommend the learning style from user learning Database to take the course, if the learning style is not coordinating with the course offered by the course provider, then system check for the following or significant style from the user learning database. On the off chance that the provider offers more than one learning style that matches to the user learning style, then framework demand that the user to pick the learning style and offer that course as per that.

3.6 Tracking User Data up to first Quiz:

In the wake of choosing the learning style, the user can bring the course with the specific learning style. User is followed with the specific learning style up to a week or up to first quiz. Following a week obviously, the framework gives a feedback, to consider the course and learning style. User tracks are measured and check for the normal rating, system checks whether the user gets advantages of utilizing that specific learning style or not. On the off chance that the user score not as much as normal rating, then framework proposes the substitute method for figuring out how to enhance the learning approach by means of learning style.

3.7 Course page and Schedule:

Course page consists of the detailed course plan which includes topics and sub topics covered, references, exercises, evaluation schemes, etc.

3.8 Course Process

MOOC makes vigorous utilization of mechanical apparatuses in learning. As a thought, it concerns an assortment of instruments, for instance, media, machines and frameworks organization gear, and notwithstanding considering shrouded speculative perspectives for their fruitful application(22).

3.9 Evaluation:

Evaluation is an efficient assurance of a subject's legitimacy, worth, and essentialness, utilizing criteria represented by norms. The main role of evaluation in addition to gaining up knowledge into earlier or existing activities is to help reflection and help with the distinguishing proof of future change(23). It can help an association, program, extend or some other intercession or activity to evaluate any point, feasible idea/proposition, or any option, to help(24) in basic leadership; or to determine the level of accomplishment or incentive as to the point and destinations and consequences of any such activity that has been finished.

3.10 Grades and certification:

Grading in MOOC is a collection of applying standardized measurements of varying levels of achievement in a course. Grades can be assigned as letters (generally A through F), as a range (for example 1 to 6), as a percentage of a total number of questions answered correctly, or as a number out of a possible total (for example out of 20 or 100)(25).

3.11 Feedback:

Feedback is data about responses to an item, a user execution of an assignment, and so on which is utilized as a reason for development.

4. Conclusion and further work:

In this paper, we introduced a systematic framework that recognize learning styles in MOOCs. We introduced a particular structured framework that takes an advantage of existing MOOCs data to provide a learning style for MOOC user. By recognizing and understanding the learning styles, can utilize procedures for more qualified people. Learning styles are an approach to help enhances the rate and nature of learning. By comprehension your very own styles, you can habituate the learning process, techniques and strategies you use. This framework is evolved you better comprehend learning styles and in addition giving a simple approach to discovering the own styles.

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